

**Introducing Operations Research into the
Curriculum of the Central American
Population Program of the University of
Costa Rica**

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SUMMARY

A FRONTIERS capacity building goal is to enable developing country academic and research organizations to teach and conduct operations research (OR). In pursuit of this goal, FRONTIERS financed and provided technical assistance to the Masters Degree Program in Population and Health of the University of Costa Rica. The 16 month Masters program is supported by the USAID funded MEASURE project. Activities included adding a module on OR intervention studies in reproductive health to the program's experimental design course, a seminar for advanced students on willingness to pay (WTP) surveys, and field research experiences for four masters students. The collaboration provided funds for post-graduate research activities, but when these were not implemented, funds were used to conduct a regional workshop on utilization of research findings. The workshop was conducted in collaboration with WHO and FRONTIERS. Students from the 1999 and 2001 entry cohorts participated in the activities.

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I. Introduction

Over the past fifteen years, Latin American institutions have conducted numerous operations research projects in reproductive health. Despite such high levels of activity, there was still no formal OR training program in Latin America. To address the lack of formal training, FRONTIERS assisted the University of Costa Rica to add OR training to the curriculum of its Masters Degree program in Population and Health, taught in close relationship with the Central American Population Program (“Programa Centroamericano de Poblacion”). Students enrolled in this program (supported by the USAID-funded Measure Project) are trained in applied program research and evaluation, and are excellent candidates to become producers of operations research. Students from all over Latin America are accepted in March of alternate years (e.g. 1999, 2001) into the 16-month program. Most students have work backgrounds in reproductive health including in the public sector, NGOs and USAID Cooperating Agencies.

II. Objectives

The specific capacity building objectives of the proposed collaboration between FRONTIERS and the University of Costa Rica included:

- To introduce operations research into the regular course curriculum
- To provide students with the opportunity to work on operations research during their internships
- To support post-graduation operations research activities with the involvement of faculty from the program

As described below, no post-graduate OR activities were funded under this sub-agreement. Instead, project funds were used to support a regional meeting on the utilization of research results.

III. Activities

Activities included a seminar for advanced students on willingness to pay (WTP) surveys, field research experiences for four Masters students, adding a module on reproductive health OR intervention studies to the program’s experimental design course, and a regional utilization workshop.

WTP Seminar and Field Research: The first FRONTIERS sponsored activity was a three-day seminar on willingness to pay survey methodology. The main topics covered on the first day included general issues of sustainability, cost-recovery and elasticity of demand, and origins and experiences with WTP in the developing world. On the second day, the seminar covered issues in conducting fieldwork including orientation to the WTP questionnaire, basics of interviewing, and a field test of the instrument in two clinics. The final day covered analysis and presentation issues. Participants included four Masters program students and two Population Council staff participants who planned to carry out WTP studies. After the seminar, FRONTIERS funded six-week research experiences on

WTP for the four Masters degree students in Guatemala, Salvador, and Ecuador. The students designed, carried out and analyzed WTP studies and presented the results at their host institutions. In Ecuador, CEMOPLAF used the survey results to set prices for services in two newly established clinics in the Amazonian region. In Guatemala, APROFAM used the results to set prices for contraceptive implants, and the El Salvador Demographic Association used the results to change prices in their San Salvador clinics. Appendix I includes the seminar agenda.

Addition of OR intervention module to experimental design course: Intervention studies – experiments and quasi-experiments – are a mainstay of operations research. The Masters program experimental design course focused on clinical trials methodology. FRONTIERS provided a co-instructor for the four-day OR module, books and materials. The four day module included: Day 1: Introduction to OR and identifying program problems and solutions; Day 2: Special problems encountered in field experiments and quasi-experiments; Day 3: Pre-experimental designs and data analysis; and Day 4: Dissemination and utilization of results. Approximately 18 students attended the course. The OR module including readings is shown in Appendix II.

Postgraduate operations research activities: Originally the project included an award to a graduating Masters student to conduct an OR project with a Latin American reproductive health program. Additional funds were budgeted to support project monitoring by a University of Costa Rica faculty member. It was not possible to find a suitable faculty/graduate combination, so a decision was made by FRONTIERS to use the award to cover research activities of a graduate of the 2000 class, Claudia Aguilar, who received a FRONTIERS fellowship with the Population Council's Honduras office. However, Ms. Aguilar relocated and was unable to conduct the research. Remaining funds were then used by the University of Costa Rica to cosponsor a regional utilization meeting.

Regional Utilization Meeting: FRONTIERS is assisting WHO to integrate operations research into its regional activities. The Latin America Regional WHO representative was interested in increasing utilization of results of WHO-funded reproductive health research projects by program managers and policy makers. WHO, FRONTIERS and the University of Costa Rica decided to sponsor a regional utilization meeting for staff members of WHO collaborating centers to discuss problems related to the utilization of their research results, and to familiarize them with the OR approach to utilization that is employed by FRONTIERS. Over 14 collaborating centers were represented at the four-day meeting. Masters students and faculty from the University of Costa Rica also attended. As a result, WHO staff drafted a new set of requirements for dissemination and utilization of information to be included in proposals submitted to the Reproductive Health Research Program of WHO.

IV. Conclusions

The capacity building activity was successful in achieving two of three objectives. Students had the opportunity to design and conduct their own operations research studies. However, this activity was not continued beyond the expiration of the original agreement. The regular experimental design course now includes lectures on field experiments, especially those utilizing pre-experimental and quasi-experimental designs. No postgraduate OR was conducted as part of the subagreement. A benefit of the University of Costa Rica involvement was that two graduates were awarded FRONTIERS fellowships. The University has requested a continuing relationship with FRONTIERS, centered on providing research opportunities similar to those made available in the WTP seminar and field research components of the collaboration.

APPENDIX I

Report of Willingness to Pay (WTP) Seminar

University of Costa Rica

San Jose, Costa Rica

January 11-14, 1999

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Dr. Juan Carlos Vargas, University of Costa Rica

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Seminar Participants/ Institution Hosting WTP study :

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Isabel Guzman/CEMOPLAF

Abelardo Quezada/Population Council – Guatemala

Carola Schwarzbauer/ Population Council – Honduras/ASHONPLAFA

Activities and Accomplishments

Seminar instructors trained a group of six students to carry out “willingness to pay” (WTP) studies. Participants included four students from the Masters degree program in Population and Health at the University of Costa Rica, and two staff from Population Council offices in Honduras and Guatemala. One element of the Masters degree program is a two-month internship; to fulfill this requirement, the four students initiated willingness to pay studies in three LAC countries immediately following the workshop. The Population Council staff participants planned to carry out WTP studies in their home countries as opportunities arose.

Workshop topics were organized into three main areas: (1) the context of WTP surveys; (2) issues in conducting fieldwork; and (3) analysis and presentation issues. Workshop facilitators used a variety of approaches, including classroom lectures, in-class exercises and directed computer-based tasks. Specific topics covered in each area included the following:

(1) The context of WTP surveys

- general issues of sustainability
- cost recovery and elasticity of demand
- origins and experiences with WTP surveys in developing countries

(2) Issues in conducting fieldwork

- orientation to the WTP questionnaire
- basics of conducting interviews
- field test of instrument in two local clinics

(3) Análisis and presentation issues

- data coding, entry and cleaning using Epi-Info
- analysis of WTP questions and construction of demand and revenue curves
- relating indicators of client socio-economic status to client WTP
- presenting research results to decision makers

On the final day of the workshop, each participant had to pass an oral exam in which s/he had to explain the entire process of carrying out a WTP survey. The following week, workshop participants traveled to various sites throughout Latin America to begin their internships.

APPENDIX II
OR Module for Experimental Design Course
University of Costa Rica
San Jose, Costa Rica
April 2000

Módulo de Investigación Operativa
Syllabus

Martes 16 08:30-10:00 Introducción: El concepto de investigación operativa en
planificación familiar/salud reproductiva
10:30-12:00 Identificación de problemas y soluciones.
Formación de grupos de trabajo

Lecturas para el día siguiente: A. Velásquez y cols., "Incrementando la utilización de servicios de salud reproductiva en una clínica de Lima." En F. R. León y M. Chú, *Investigación de operaciones en planificación familiar y salud reproductiva: Conceptos y casos*, 1998. R. Vernon y cols., "Una prueba de estrategias alternativas de supervisión para servicios de planificación familiar en Guatemala." En J. R. Foreit & T. Frejka, *Investigación operativa en planificación familiar: Lecturas selectas*, 1998.

Miércoles 17 08:30-10:00 Experimentos de campo.
Grupos de trabajo: Identificación de problemas.
10:30-12:00 Cuasi-experimentos.
Grupos de trabajo: Formulación de soluciones.

Lecturas para el día siguiente: J. R. Foreit *et al.*, "Una comparación del desempeño de hombres y mujeres distribuidores de DBC en Perú." En J. R. Foreit & T. Frejka, *Investigación operativa en planificación familiar: Lecturas selectas*, 1998. F. R. León & A. Cuesta, "La necesidad de metodologías cuasiexperimentales para evaluar los efectos de la fijación de precios." En F. R. León y M. Chú, *Investigación de operaciones en planificación familiar y salud reproductiva: Conceptos y casos*, 1998.

Jueves 18 08:30-10:00 Pre-experimentos.
Grupos de trabajo: Diseño del estudio.
10:30-12:00 Análisis de datos.
Grupos de trabajo: Elaboración de la propuesta.

Lecturas para el día siguiente: J. R. Foreit & T. Frejka, "Introducción". En J. R. Foreit & T. Frejka, *Investigación operativa en planificación familiar: Lecturas selectas*, 1998. A. Fisher *et al.*, *Manual de investigación de operaciones en planificación familiar*, capítulos 10 y 11, 1995.

Viernes 19 08:30-10:00 Divulgación y utilización de resultados.
Grupos de trabajo: Presentación de proyectos 1 y 2.
10:30-12:00 Consideraciones extra-científicas
Grupos de trabajo: Presentación de proyectos 3 y 4.

APPENDIX III

WORKSHOP ON UTILIZATION OF RESEARCH RESULTS SAN JOSÉ, COSTA RICA June 4 – 7, 2002

**WHO Research Reproductive Health Research (RHR)
Population Council/FRONTIERS
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I. INTRODUCTION

The World Health Organization (WHO) has for many years supported reproductive health research in developing countries, but only recently has it been emphasizing the need to improve the utilization of research findings by policies and programs. This is something that was not done before and justifies the initiative of organizing this workshop. The WHO/Reproductive Health Research (RHR) Department focus on utilization is manifest in the organization of regional workshops for high-level political decision makers, program managers, and heads of research institutions. These workshops provide a forum for the dissemination of research results to program managers and policy makers.

A second RHR goal is to increase the use of operations research (OR) to solve reproductive health care service delivery problems. This report describes a second approach to utilization, which is being tested by WHO/RHR with the assistance of the FRONTIERS Program. This approach uses lessons learned about utilization of OR and other types of research to sensitize researchers, policy makers, and program managers to factors that impede or facilitate the utilization of research findings. We believe that the OR utilization model is especially appropriate because the goal of OR is to improve reproductive health service delivery programs, and the success indicator for OR is whether results were used in making programmatic decisions.

The first regional workshop on utilization took place in San José, Costa Rica, June 4 – 7, 2002, and was funded and organized by WHO/RHR, the Population Council's FRONTIERS Program, and the Central American Center for Population of the University of Costa Rica.

II. OBJECTIVES

The workshop objectives were:

- To increase utilization of research results by reproductive health programs in the LAC region by increasing the researcher's knowledge of what constitutes programmatically relevant research, and by enhancing the ability of researchers and program managers to work together at all stages of the research process.
- To train researchers and managers in ways to improve utilization of results prior to beginning operations research activities at the WHO Collaborating Centers in LAC.
- To identify what utilization problems are frequently encountered by participants and suggest ways to overcome those problems.

III. CONCEPTS EMPHASIZED BY THE WORKSHOP

Workshop organizers began by reviewing the extensive literature on utilization, which was operationally defined as the use of research findings by managers and policymakers in making decisions about programs. The workshop regarded the following factors as instrumental in increasing the likelihood of utilizing results.

- ***Relevance of research results:*** Are the findings actionable? Does the research project include factors that are under the control of managers or policymakers?
- ***Salience of research results:*** Does the research address health system priorities? Are proposed solutions to problems identified by the research considered viable by managers and policymakers?
- ***Dissemination of research results:*** Program decision makers must be made aware of the results of a project before those results can be utilized. For this reason, dissemination specifically targeted at the decision maker must be planned prior to beginning research. Although provision of information is necessary for research to be used, it does not suffice to produce utilization.
- ***Mechanisms and resources that facilitate utilization:*** Utilization of results can be a complicated process that involves policy statements, changes in program norms, and budget negotiations. Researchers and managers participating in a research project need to be aware of the steps that must be taken to ensure utilization and should be part of the utilization process.
- ***Close relationship between researchers and managers:*** The relationship between researchers and managers must be mutually respectful, and each must understand the role that the other plays in producing a successfully utilized research product. The researcher must be familiar with and trusted by the program, and have access to decision makers. Researchers and managers must work together to ensure that the proposed research is relevant and salient to the program. Dissemination and utilization plans must be produced collaboratively, and both the manager and the researcher must become advocates of the findings. Moreover, the researcher must be prepared to assist the manager in planning, conducting, and evaluating up-scaling activities.

IV. AGENDA

The themes discussed with participants during working group sessions refer to the most important issues that define the concept of utilization of research results. Facilitators presented the following ideas:

- Concepts about utilization of research
- Operational definition of utilization
- Relevance of research to programs

- Examples of utilization in operations research
- Utilization of data from the manager's perspective
- Importance and key elements of a dissemination plan
- Importance and key elements of a utilization plan

Presentation on the relevance of research to programs included a “game” to determine the relevance and potential usefulness of research to managers. The game required that working groups identify the importance of study variables to the program and the number of such variables that was under managerial control.

V. PARTICIPANTS

Participants came from various Latin American institutions collaborating with the Department of Reproductive Health and Research of WHO, as well as staff from a small number of organizations in countries such as Costa Rica, Nicaragua, El Salvador and Guatemala. Invited institutions had experience in conducting biomedical, epidemiologic or social science research, strong links to reproductive health service delivery programs, and an interest in participating in future operations research activities. Institutions represented in the workshop are listed below.

- Unidad de Programas Materno Infantiles y Nutricionales, Ministerio de Salud, Buenos Aires, Argentina.
- Centro Rosarino de Estudios Perinatales (CREP), Rosario, Argentina
- Centro de Estudios de Población (CENEP), Buenos Aires, Argentina
- CEMICAMP, Campinas, Brazil
- PAHO Representation in Costa Rica, Ministry of Health
- Programa Centroamericano de Población, Universidad de Costa Rica
- Caja Costarricense del Seguro Social, San José
- Centro de Investigación Epidemiológica en Salud Sexual y Reproductiva (CIESAR), Guatemala
- Instituto Nacional de Salud Pública, Cuernavaca, México
- PAHO Representation in Peru
- Universidad Peruana Cayetano Heredia, Perú
- Pan-American Health Organization (PAHO), Washington, D.C.
- Family Health International
- Faculty and advanced graduate students from Master's Programs, University of Costa Rica

Facilitators were supplied by WHO, the Population Council's FRONTIERS Program, and CEMOPLAF—an NGO working in Reproductive Health issues and long experienced in OR projects—to provide the manager's perspective on the utilization of research results.

VI. STRUCTURE OF THE WORKSHOP

Prior to the workshop, participants responded to six questions about their own research projects, identifying objectives, independent and dependent variables, perspectives on utilization of results by health programs, and the perception about the importance of research in the local context.

The workshop consisted of presentations and working groups discussions relative to the main elements of dissemination and utilization plans built around the following questions:

1. Who is the main user of research results?
2. How will health services and programs benefit from your research results? To what extent and level would they be utilized?
3. How could you explore the interest of potential users of results?
4. Which dependent variables are important to the program, and which independent variables would be under the control of the program?
5. Who are the target audiences of research results? Describe each segment.
6. What is your communication objective?
7. What media or channels do you intend to use for each segment? Prepare a message for each audience and medium.
8. What is your concrete proposal for the utilization of research results?
9. What factors (social, political, cultural, or programmatic) could hinder the utilization of results? What factors may facilitate the use of results?
10. Describe economic implications of the utilization proposal, i.e. costs associated with replication, scaling-up, or expansion of research results in a region, or countrywide.

For the Dissemination Plan, the participants had to fill out a matrix with the corresponding specifics and components. The six questions below are related to and provide additional information on the general dissemination-utilization plan's questions 5, 6, and 7.

1. Identify your audiences. Describe each segment.
2. What is your communication objective?
3. What media or communication channels are you planning to use for each audience?
4. Prepare messages for each audience and medium.
5. Prepare a budget for each activity.
6. Prepare a timetable of activities indicating the name of the person responsible for each activity.

Audience	Communication Activity / Person Responsible	Message	Media/Channel	Dates	Cost

VII. FREQUENTLY ENCOUNTERED PROBLEMS

Discussions revealed that very few participants included dissemination plans or budgets in their research proposals, and that the WHO did not require these plans for funding a research proposal. Other problems included lack of research relevance and absence of close working relationships with managers and policymakers. Most participants complained that policymakers and managers showed little interest or understanding of their research projects. Finally, some participants concluded that being involved in efforts directed at utilization was inimical to their role as impartial scientists.

Recommendations

In replicating the Workshop, some of the following recommendations made by participants should be taken into consideration:

- a) Review contents of presentations to avoid repetition.
- b) Eliminate sessions 5 and 6 or incorporate them into other sessions.
- c) Allow more time for discussion and analysis to promote greater interaction.
- d) Determine how to include discussion on utilization of other types of research in the Workshop.
- e) Based on concrete examples, discuss and practice strategies to utilize and disseminate research results.
- f) Set up systems to evaluate utilization of research results.

The last session of the workshop consisted of questions made by the workshop sponsors to participants to probe deeper into their perception of the usefulness of this type of training. Some recommendations follow.

- The workshop should not only discuss concepts but also strategies for utilization.

“I need to translate these results not for dissemination among my colleagues, but among institutions that provide health services at the grass roots level. This is a different level; (in this case) it is not the scientific community, with which I know how to deal.”

- The workshop should include case studies that are adequate for adult learning. A case study demonstrates processes and shows how to prepare dissemination and utilization plans.

“I ask myself, how do I learn new things? For me it is easier to learn from others, from something that I have seen done instead of me creating something from scratch.”

- Distance Training is an approach that participants recommend. They propose that communication specialists and researchers with experience in successful dissemination and utilization efforts should talk about processes and outcomes — including failures and successes—, through a variety of channels such as e-mail, CD-ROMs, or websites.

“Dissemination on the Internet and the use of CD-ROMs are important means of sharing an experience with others, especially if people include not only why but how they did it and what they learned from the experience. This makes you think how you can use this information in your field, in your research.”

- Create a Web page describing the know-how.

“A group of people from this university (Costa Rica) are interested in developing this idea. We could work together to pool experiences from researchers so that we all can learn from them.”

- Create a group of experts that help researchers translate results into practice.

“I would like to know more about the opinion that some of you have about a committee that participates in the approval process. On the other hand, some of you are proposing to have a group of people trained to help researchers put results into practice.”

- Availability of a contact at the WHO Centers that could advise researchers on how to present to donors strategies for the dissemination and utilization of research results at health service institutions.

“I think one person trained at the Centers would be enough to work with the researcher.”

- Participants agree with the proposal to include questions in the “orange book” regarding the dissemination and utilization of results, implying that the researcher would have to think about these topics. Another proposal is to have a panel of experts counseling researchers on how to establish adequate communication with service institutions for the incorporation of evidence-based information into health programs.

“Once we have our research results, we need to be clear as to how to replicate the study, what the barriers are, what lessons were learned about dissemination and

utilization, and how a specialist or a committee could help the researcher. We have experts on ethics; we could also have a team of experts in dissemination, replication, and all the themes that have been discussed this week, to help the Centers.”

“The centers should have someone you can consult with, a group of experts dedicated to replication and results dissemination.”

- Research should be conducted considering that it will be used in private or public health institutions. For that purpose, the researcher should be aware of the changes taking place in the health sector of their country.

“We have to be aware that there are changes in the institutions and in the way health services are provided. The researcher cannot go to a Ministry of Health proposing interventions that do not fit in with the way the Ministry operates, i.e, when they are not providing services anymore.”

“We have to build a bridge that allows communication between the researcher and the decision maker.”

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